Characteristics of Prospective Algae for the Culture of Marine Organisms

Richard L. Hubbard larviculture@hotmail.com

Bacillariophyta

	Cylindrotheca closterium	Navicula cf_perminuta	Nitzschia cf_ovalis	Phaeodactylum tricornutum	Chaetoceros sp.	Skeletonema tropicum	Thalassiosira oceanica
Class	Bacillariophyceae	Bacillariophyceae	Bacillariophyceae	Bacillariophyceae	Coscinodiscophyceae	Coscinodiscophyceae	Coscinodiscophyceae
PROVASOLI-GUILLARD CCMP#	340	1117	1118	633	199	789	1003
Cell Length um	20-24	6-8	5-8	13-25	3-6	6-19	5-8
Cell Width um	3-4	4-5	3-4	3-5	3-4	6-10	4-6
Low Temp C	22	22	18	22	22	22	22
High Temp C	26	26	26	26	26	26	26
Initial Source	Sargasso Sea	Gulf of Maine	Baja Ca., Mexico	Mariana Is., Guam	Sargasso Sea	Caribbean Sea	Sargasso Sea
Habitat	open ocean, 120 meter	Pidgeon Hill Bay	Magdalena Bay	near shore	open ocean	Surinam	open ocean
Axenic	No	Yes	No	Yes	Yes	No	No
Culture Medium	L1+, f/2, f/20	f/2+10%NPM, f/2p, f/2	f/2:	f/2, f/2agar	f/2, AlgaGro	f/2:	f/2, f/2agar
FATTY ACIDS (%) – Saturated							
Myristic 14:0				5.0	18.9	24.9	5.5
15:0					0.32		0.6
Palmitic 16:0				21.6	14.2	17.6	13.7
Stearic 18:0			0.6		0.2	0.9	0.5
Arachidic 20:0							trace
22:0							0.1
Lignoceric 24:0					0.35		0.5
Monoenoic							
16:1n-7				37.2	32.4	22.3	27
18:1n-11						1.2	
Oleic 18:1n-9			1.2		0.2	1.7	0.2
18:1n-7			0.8	0.9		1.4	0.3
20:1n-9							0.1
22:1n-11					>.05		
Polyenoic							
16:2n-7			4.6		7.5	2.6	1.9
16:2n-4							4.7
16:3n-4			7.0		3.7	2.9	4.5
16:4n-3				3.2			
18:2n-6			0.8		0.6	1.5	0.3
18:3n-6			0.6		0.3	0.3	0.8
18:3n-3			0.2			0.2	0.1
18:4n-3			0.5	0.9	0.3	3.3	6.2
20:2n-6						0.2	
20:3n-6							0.1
20:3n-3							trace
AA 20:4n-6	1-5	0.2-1	1-5		4.9	1.4	0.2-1
20:4n-3					0.4		0.1
EPA 20:5n-3	>20	>20	>20		9.7	5.7	5-20
22:4n-6				15.1			
DPA 22:5n-6							0.1
22:5n-3				0.2			trace
DHA 22:6n-3	1-5	1-5	1-5	1.8	0.6	2.2	1-5
CAROTENOID							
β-carotene - ß,ß	YES	YES	YES	YES	YES	YES	YES
Diadinoxanthin				YES			
Diatoxanthin	YES	YES	YES	YES	YES	YES	YES
Fucoxanthin	YES	YES	YES	YES	YES	YES	YES
Lutein	YES	YES	YES	YES	YES	YES	YES
CHLOROPHYLL							
Chlorophyll α	YES	YES	YES	YES	YES	YES	YES
Chlorophyll c1	YES	YES	YES	YES			
Chlorophyll c2	YES	YES	YES	YES	YES	YES	YES
STORED FOOD							
Chrysolaminaran	YES	YES	YES	YES	YES	YES	YES
SUGARS (%)							
Arabinose			2.4	0.15	0.27	1.4	0.19
Fucose			12.8	4.3	10.6	3.4	2.8
Galactose			18.4	8.9	17.7	7.0	5.4
Glucose	YES	YES	32.6	21.0	56.3	62.0	82.4
Mannose			16.8	45.9	3.8	11.4	5.0
Rhamnose			7.7	8.6	4.7	6.6	1.3
Rhibose			2.1	3.7	3.4	5.4	1.4
Xylose			7.0	7.5	4.3	2.8	1.6
CELL WALL							
α, e-Diaminopimelic acid				YES			
Silica	YES	YES	YES	YES	YES	YES	YES
AMINO ACIDS							
Alanine Ala			6.9	7.2	7.0	7.3	7.4
Arginine Arg			7.1	6.6	6.5	6.4	6.3
Aspartate Asp			8.8	8.6	8.9	10.1	9.7
Cysteine Cys			0.58	0.38	0.47	0.4	0.53
Glutamate Glu			10.6	11.2	10.0	10.4	10.4
Glycine Gly			6.0	5.8	5.5	6.4	6.2
Histidine His			1.4	1.7	2.2	1.6	1.6
Isoleucine Ile			5.0	4.9	5.7	5.2	5.5
Leucine Leu			8.1	7.7	7.7	8.3	8.4
Lysine Lys			5.7	5.6	5.7	5.7	5.9
Methionine Met			1.6	1.9	2.5	2.2	2.2
Ornithine			0.52	1.4	0.27	0.39	0.21
Phenylalanine Phe			6.9	6.6	6.9	6.4	6.8
Proline Pro			4.6	6.3	6.0	4.9	4.8
Serine Ser			6.6	5.9	6.2	6.1	6.8
Threonine Thr			5.5	5.4	5.2	5.1	5.2
Tryptophan Trp			1.4	1.6	1.5	1.3	0.87
Tyrosine Tyr			3.9	4.1	5.0	4.5	4.2
Valine Val			6.2	5.9	6.1	6.3	6.1

Chlorophyta

	Asteromonas gracilis	Chlamydomonas sp.	cf_Chlorella sp.	Dunaliella sp.	cf_Nannochloris sp.	Mantoniella squamata	Micromonas pusilla	Nephroselmis pyriformis	Pycnococcus provasolii	cf_Pyramimonas sp.	Tetraselmis sp.
Class	Chlorophyceae	Chlorophyceae	Chlorophyceae	Chlorophyceae	Chlorophyceae	Prasinophyceae	Prasinophyceae	Prasinophyceae	Prasinophyceae	Prasinophyceae	Prasinophyceae
CCMP#	140	231	253	366	530	480	487	549	1203	1239	929
Cell Length um	19-23	5-6	1-4	13-15	2-4	3-5	1-2	4-8	2-4	5-10	6-7
Cell Width um	12-19	5-6	1-4	4-5	2-4	3-5	1-2	3-5	2-4	4-6	5-7
Low Temp C	22	22	22	22	22	22	22	22	22	22	22
High Temp C	26	26	26	26	26	26	26	26	26	26	26
Initial Source	San Quintin, Mexico	North Atlantic	Narragansett Bay, R.I.	Unknown	Caribbean Sea	Brancaster, UK	Sargasso Sea	Sonora, Mexico	North Atlantic	La Jolla, Ca.	Falmouth, Ma.
Habitat	outer coast	25 meter	rock pool	unknown	mangrove pool	salt marsh	open ocean 20-25 meter	Gulf of California	30 meter	SIO pier	Oyster Pond
Axenic	No	Yes	Yes	No	No	No	No	No	Yes	No	Yes
Culture Medium	Prov100, Prov100 agar	h/2, Prov100, K	f/2-si, f/2	f/2, f/2agar, +50um NH4Cl	f/2-si, f/2	K, Prov50	f/2-si, K, ASM2	f/2-si, Prov, L/20	f/2-si, K, ASP8a,	Prov100, Prov100 sloppy	f/2-si, f/2agar
Myristic 14:0				0.4				1.7			2.3
Palmitic 16:0				41.7							19
Stearic 18:0				2.9				2.3			1.9
Lignoceric 24:0				0.43							
16:1n-7				7.3				5.9			4.7
Oleic 18:1n-9				8.8				2.4			7
18:1n-7								3.8			1.5
16:2n-7				1.16							
16:3n-6				3.96							
16:4n-3				3.7				13.1			16.3
18:2n-6				15.1				3.0			5.0
18:3n-6								1.3			
18:3n-3				20.5				14			20.5
18:4n-3				0.6				18			6.9
AA 20:4n-6					0.2-1			1.9			0.2-1
EPA 20:5n-3					1-5		0.2-1			0.2-1	5-20
DHA 22:6n-3							5-20	3.0	5-20	1-5	0.1
α-carotene - ß,Є				YES							
β-carotene - ß,ß	YES			YES		YES		YES			
γ-carotene - ß,ψ			YES	YES							
Antheraxanthin			YES	YES			YES			YES	YES
Astaxanthin			YES	YES	YES		YES	YES	YES	YES	YES
Canthaxanthin			YES	YES	YES		YES	YES	YES	YES	YES
Echinenone				YES							
Flavoxanthin			YES	YES	YES		YES	YES	YES	YES	YES
Fucoxanthin				YES					YES		
Loraxanthin			YES	YES	YES		YES	YES	YES	YES	YES
Lutein			YES	YES			YES		YES	YES	YES
Neoxanthin			YES	YES		YES	YES	YES	YES	YES	YES
Prasinoxanthin						YES	YES		YES		
Uriolide						YES	YES				
Violaxanthin			YES	YES	YES	YES	YES	YES	YES	YES	YES
Zeaxanthin			YES	YES	YES	YES	YES	YES	YES	YES	YES
Chlorophyll α	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Chlorophyll β			YES	YES	YES	YES	YES	YES	YES	YES	YES
MgDVP						YES	YES		YES		
Starch			YES	YES	YES		YES	YES	YES	YES	YES
Arabinose			1.3	0.65	0.16		1.3		0.04	1.3	0.5
Fucose			7.9		7.9		2.5		0.3	2.4	0.6
Galactose			15.2	1.1	10.6		5.7		3.8	5.1	6.1
Glucose			50.1	85.3	55.2		78.6		81.4	78.4	88.3
Mannose			10.1	4.5	5.0		2.0		11.5	2.0	2.3
Rhamnose			8.1	5.5	13.3		4.4		0.3	4.4	0.4
Rhibose			3.5	2.0	1.0		2.0		2.0	2.0	1.4
Xylose			3.9	1.0	6.6		3.6		0.7	2.9	0.4
Cellulose			YES	YES	YES		YES	YES	YES	YES	YES
Pectins			YES	YES	YES		YES	YES	YES	YES	YES
Silica			YES	YES	YES		YES	YES	YES		
Alanine Ala			7.6	8.0	8.2		8.8		7.8	8.4	6.9
Arginine Arg			8.3	6.8	5.9		4.7		6.5	5.3	15.0
Aspartate Asp			8.4	9.0	8.3		8.3		8.0	8.5	7.7
Cysteine Cys			1.2	0.44	0.55		0.89		1.1	1.0	1.3
Glutamate Glu			11.0	10.3	11.4		10.4		12.4	10.2	9.6
Glycine Gly			5.8	6.0	6.3		7.5		7.6	6.0	5.4
Histidine His			2.1	2.1	1.8		1.5		1.9	1.8	2.2
Isoleucine Ile			4.1	4.8	3.4		3.9		3.9	3.4	4.0
Leucine Leu			6.7	8.4	7.5		10.1		7.8	10.1	6.6
Lysine Lys			5.8	6.0	5.2		5.9		6.1	6.9	5.3
Methionine Met			2.1	1.4	1.9		1.8		2.1	2.1	1.9
Ornithine				0.35	0.35						0.7
Phenylalanine Phe			5.8	6.7	5.5		7.0		4.9	7.6	6.1
Proline Pro			7.9	6.5	13.1		5.5		5.7	6.1	5.1
Serine Ser			4.9	5.2	4.8		5.9		6.4	4.4	4.7
Threonine Thr			5.2	4.7	4.0		5.1		5.5	5.0	5.3
Tryptophan Trp			0.8	1.5	1.1		1.0		1.3	1.8	1.5
Tyrosine Tyr			4.4	5.0	3.9		4.3		4.1	5.0	4.4
Valine Val			5.7	6.2	5.9		4.4		5.4	5.0	5.4

Trebouxiophyceae, Chrysophyta

	Stichococcus minor	Ochromonas sp.	Rhizochromulina cf_marina	Pelagococcus sp.	Pelagomonas calceolata	Sarcinochrysis marina
Class	Trebouxiophyceae	Chrysophyceae	Dictyochophyceae	Pelagophyceae	Pelagophyceae	Pelagophyceae
CCMP#	819	584	1243	1252	1682	770
Cell Length um	4-6	3-6	4-8	2-4	1-2	4-8
Cell Width um	2-3	3-6	4-8	2-4	1-2	4-8
Low Temp C	0	22	22	22	22	22
High Temp C	36	26	26	26	26	26
Initial Source	Caribbean Sea	Sargasso Sea	Sargasso Sea	Sargasso Sea	HOTS Site, Hawaii	Hawaii
Habitat	lagoon, Key Largo, Fl.	open ocean, 20-25 meter	open ocean, surface	open ocean 20-25 meter	open ocean	rock surface
Axenic	No	No	No	No	No	No
Culture Medium	f/2-si, f/2	Prov50+Rice, K+Rice,	K, ASM4, ASM3	K, ASM4, FSW1/2:1/2	L1, K	f/2-si, Prov
Myristic 14:0		<1.0				
Palmitic 16:0		2.84				
Stearic 18:0		<1.0				
Arachidic 20:0		2.57				
22:0		<1.0				
16:1n-7		2.77				
Oleic 18:1n-9		7.37				
20:1n-11		3.88				
22:1n-11		2.12				
16:3n-6		<1.0				
18:2n-6		4.63				
18:3n-3		12.19				
18:4n-3		15.91				
20:2n-6		5.53				
20:3n-6		12.16				
AA 20:4n-6		8.13				
β-carotene - ß,ß	YES			YES	YES	
e-carotene - Є,Є	YES			YES		
Antheraxanthin	YES					
Astaxanthin	YES					
Canthaxanthin	YES					
Flavoxanthin	YES					
Fucoxanthin				YES	YES	
Loraxanthin	YES					
Lutein	YES					
Violaxanthin	YES					
Zeaxanthin	YES					
Chlorophyll α	YES	YES	YES	YES	YES	YES
Chlorophyll β	YES					
Chlorophyll c3				YES	YES	
Starch	YES					
Arabinose	1.6					
Fucose	16.5					
Galactose	8.7					
Glucose	55.4					
Mannose	5.8					
Rhamnose	4.7					
Rhibose	3.3					
Xylose	3.9					
Cellulose	YES					
Pectins	YES					
Silica	YES					
Alanine Ala	8.3					
Arginine Arg	6.1					
Aspartate Asp	9.5					
Cysteine Cys	1.7					
Glutamate Glu	12.4					
Glycine Gly	5.5					
Histidine His	1.6					
Isoleucine Ile	3.9					
Leucine Leu	7.4					
Lysine Lys	6.4					
Methionine Met	1.6					
Phenylalanine Phe	5.1					
Proline Pro	8.2					
Serine Ser	4.9					
Threonine Thr	5.2					
Tryptophan Trp	1.3					
Tyrosine Tyr	3.8					
Valine Val	5.3					

Cryptophyta, Cyanophyta, Euglenophyta, Eustigmatophyta

	Chroomonas sp.	Chroomonas pauciplastida	Hemiselmis sp.	Proteomonas sulcata	Rhodomonas lens	Prochlorococcus marina	Synechococcus sp.	Eutreptia sp.	Nannochloropsis salina
Class	Cryptophyceae	Cryptophyceae	Cryptophyceae	Cryptophyceae	Cryptophyceae	Cyanophyceae	Cyanophyceae	Euglenophyceae	Eustigmatophyceae
CCMP#	270	268	441	705	739	1375	842	389	537
Cell Length um	6-9	4-8	4-7	10-13	8-13	0-0	0-3	29-80	2-8
Cell Width um	2-4	0-0	3-5	6-8	5-8	0-0	0-1	8-12	1-4
Low Temp C	22	18	18	22	22	14	22	22	22
High Temp C	26	26	26	26	26	27	26	26	26
Initial Source	Woods Hole, Ma.	Woods Hole, Ma.	Gulf of Mexico	Sonora, Mexico	Gulf of Mexico	Sargasso Sea	Sargasso Sea	Sargasso Sea	Narragansett Bay, R.I.
Habitat	Eel Pond	outdoor tank	Gulf Stream	Gulf of California	Gulf Stream	open ocean euphotic	open ocean 17 meter	open ocean 50 meter	rock pool
Axenic	No	Yes	No	No	Yes	No	No	No	Yes
Culture Medium	h/2, PR50, f/2-si, K, sloppy agar	DCM, K, L1, ST3	K, Prov50, ASM2	Prov50	f/2-si, K, DV, DCM, f/2-si+	PRO99, PC	K	L1, L/20, K, Prov100,	f/2-si, f/2
Myristic 14:0	8.07	8.07			6.4				5.43
iso 15:0									0.3
15:0	1.6	1.6							0.36
Palmitic 16:0	10.63	10.63			13.7				21.23
Stearic 18:0	2.5	2.5			2.5				0.6
Lignoceric 24:0									1.13
16:1n-7	1.66	1.66			3.5				23.13 %
t16:1n-13	1.06	1.06							0.2
18:1n-11	0.82	0.82							
Oleic 18:1n-9	1.51	1.51			2.4				2.25
18:1n-7	1.86	1.86			4.7				0.48
20:1n-9	0.5	0.5							
16:2n-7									0.27
16:3n-6									0.48
16:3n-4									0.6
18:2n-6	27.25 %	27.25			1.9				4.57
18:3n-6	3.28	3.28			1.8				0.34
18:3n-3	14.19 %	14.19			25.2				
18:4n-3	9.36	9.36			22.6				
20:3n-9									0.31
20:3n-6									0.3
AA 20:4n-6	2.69	0.2-1			0.2-1				5.89
20:4n-3	1.6	1.6							
EPA 20:5n-3	6.7	5-20			5-20				29.9
DPA 22:5n-6	0.61	0.61							
22:5n-3	2.9	2.9							
DHA 22:6n-3	22.2	22.2			5-20				
α-carotene - ß,Є		YES							
Alloxanthin	YES	YES			YES				
Antheraxanthin					YES				
Crocoxanthin	YES	YES							
Diatoxanthin	YES								
Monadoxanthin	YES	YES							
Zeaxanthin							YES		
Chlorophyll α	YES	YES	YES	YES	YES	YES	YES	YES	YES
Chlorophyll β						YES			
Chlorophyll c2	YES				YES				
Divinyl Chlorophyll α						YES			
α, e-Diaminopimelic acid							YES		
Arabinose	0.08	0.08							
Fucose	3.0	3.0							4.4
Galactose	2.7	2.7							3.8
Glucose	87.5	87.5							68.2
Mannose	2.3	2.3							6.1
Rhamnose									8.3
Rhibose	2.5	2.5							4.6
Xylose	1.6	1.6							4.4
Alanine Ala	7.9	7.9							7.4
Arginine Arg	6.7	6.7							7.3
Aspartate Asp	9.5	9.5							7.6
Cysteine Cys	0.63	0.63							0.41
Glutamate Glu	10.9	10.9							10.1
Glycine Gly	5.8	5.8							5.5
Histidine His	1.8	1.8							2.1
Isoleucine Ile	4.1	4.1							4.8
Leucine Leu	7.8	7.8							7.8
Lysine Lys	6.1	6.1							6.1
Methionine Met	2.4	2.4							1.6
Ornithine	0.28	0.28							0.35
Phenylalanine Phe	5.5	5.5							6.2
Proline Pro	5.4	5.4							9.3
Serine Ser	5.9	5.9							5.0
Threonine Thr	5.4	5.4							5.5
Tryptophan Trp	1.3	1.3							1.6
Tyrosine Tyr	5.6	5.6							4.2
Valine Val	6.1	6.1							6.5

Haptophyta (Prymnesiophyceae)

	Chrysochromulina ericina (not toxic to fish)	Emiliania huxleyi	Isochrysis sp.	Pavlova pinguis	Phaeocystis sp.	Prymnesium sp. (toxic to fish)
CCMP#	283	372	463	609	629	711
Cell Length um	4-8	3-6	4-8	5-6	3-8	8-12
Cell Width um	3-8	1-2	4-6	5-6	3-8	5-8
Low Temp C	11	22	22	22	18	22
High Temp C	26	26	30	26	26	26
Initial Source	Gulf of Maine	Sargasso Sea	Turks and Caicos, BWI	Sargasso Sea	Gulf of Mexico	Gouldsboro Bay, Me.
Habitat	12 meter	open ocean 40 meter	channel	open ocean 20-25 meter	Gulf Stream	water edge
Axenic	No	Yes	Yes	No	No	No
TOXIC	TOXIC					TOXIC
Culture Medium	L1, K	f/50	f/2, K	f/2-si, K, ASM2,	K, L/20, K/20	f/2-si
Myristic 14:0	7.6	14	18.9	8.8	21	6
iso 15:0			trace	0.1		
15:0			0.28	0.2		
Palmitic 16:0	27.5	5	14.2	17.3	25	16
Stearic 18:0	0.6		0.1	0.3	2	
22:0			trace			
16:1n-7		1	9.54	14.1	4	10
t16:1n-13			trace			
Oleic 18:1n-9	5.4	4	6.9	0.6	30	25
18:1n-7			1.1	2.4		
22:1n-11			1.1			
16:2n-7			0.8	2.1		
16:3n-4			1.2			
16:4n-3			0.36			
18:2n-6	5.7	4	2.5	0.6	1	18
18:3n-6	1.0		2.1	.5		
18:3n-3	0.5	5	5.51	2.1	1	11
18:4n-3	2.8	11	16.35 %	10.9	1	2
18:5n-3		YES				
20:3n-3			0.35			
AA 20:4n-6	1.0		0.62	0.7		
EPA 20:5n-3	12.4	1	0.63	27.6		4
DPA 22:5n-6	5.3		1.61	2.4		
22:5n-3				0.2		
DHA 22:6n-3	10.7	28	9.5	5-20		
β-carotene - ß,ß		YES		YES		
Diadinoxanthin		YES		YES		
Diatoxanthin		YES		YES		
Fucoxanthin		YES		YES		
Chlorophyll α	YES	YES	YES	YES	YES	YES
Chlorophyll c1			YES	YES		
Chlorophyll c2	YES	YES	YES	YES	YES	YES
Chlorophyll c3		YES			YES	YES
Arabinose			6.4	6.7		
Fucose			0.8	2.1		
Galactose			13.9	8.7		
Glucose			73.4	61.8		
Mannose			4.8	9.2		
Rhamnose			0.2	1.1		
Rhibose			2.9	3.0		
Xylose			2.8	7.6		
Calcium	YES	YES	YES			
Cellulose	YES		YES			
Alanine Ala			7.9	8.0		
Arginine Arg			7.3	8.3		
Aspartate Asp			8.5	8.7		
Cysteine Cys			0.5	0.48		
Glutamate Glu			10.5	10.5		
Glycine Gly			5.9	5.9		
Histidine His			2.1	1.8		
Isoleucine Ile			4.7	4.6		
Leucine Leu			8.7	8.6		
Lysine Lys			6.1	5.9		
Methionine Met			2.4	1.9		
Ornithine			0.34	0.4		
Phenylalanine Phe			6.2	6.3		
Proline Pro			5.8	5.4		
Serine Ser			5.0	5.1		
Threonine Thr			4.9	4.8		
Tryptophan Trp			1.4	1.2		
Tyrosine Tyr			4.4	3.9		
Valine Val			6.2	6.4		

Pyrrophyta (Dinophyceae) and Rhodophyta (Rhodophyceae)

	Amphidinium operculatum	Gonyaulax cf_cochlea	Gymnodinium sp.	Prorocentrum lima	Prorocentrum mexicanum	Protoceratium reticulatum	Porphyridium cruentum	Rhodella maculata	Rhodosorus sp.	Rhodosorus marinus
CCMP#	1342	1592	426	1368	1370	1720	675	736	1530	769
Cell Length um	0-0	0-0	10-15	0-0	0-0	35-60	0-6	7-16	0-0	5-8
Cell Width um	0-0	0-0	8-12	0-0	0-0	30-45	0-0	7-16	0-0	5-8
Low Temp C	18	18	22	18	17	22	22	22	18	11
High Temp C	26	22	26	26	26	26	26	26	22	16
Initial Source	Caribbean Sea	Narragansett Bay, R.I.	Caribbean Sea	Caribbean Sea	Caribbean Sea	Miami, Fl.	La Jolla, Ca.	Essex, England, UK	Isabella I., Galapagos I.	Hawaii
Habitat	Knight Key, Fl.	Narragansett Bay	Florida Everglades	Knight Key, Fl.	Knight Key, Fl.	Biscayne Bay	SIO pier	beach sand	Elizabeth Bay surface	open ocean
Axenic	No	No	No	No	No	No	No	Yes	No	No
TOXIC	TOXIC			TOXIC	TOXIC	TOXIC				
Culture Medium	K	K	f/2-si, L1, Prov, K	K	K	K, L1	f/2agar, Prov, f/2-si,	K, f/2-si, L/20	f/2-si	Prov, f/2-si
Myristic 14:0							5.3		0.4	0.4
Palmitic 16:0							28.5		24.5	24.5
Stearic 18:0							7		1.6	1.6
16:1n-7									1.6	1.6
Oleic 18:1n-9							17.1		13.9	13.9
18:1n-7							2.7		2.8	2.8
16:3n-4									2.8	2.8
18:2n-6							3.5		9.8	9.8
18:3n-3									20.7	20.7
20:2n-6							0.6			
20:3n-6							0.6			
AA 20:4n-6							17		2.5	2.5
EPA 20:5n-3							9.6		7.8	7.8
DHA 22:6n-3									0.4	0.4
β-carotene - ß,ß	YES									
Diadinoxanthin	YES									
Diatoxanthin	YES									
Dinoxanthin	YES									
Neoxanthin	YES	YES	YES	YES	YES	YES				
Peridin	YES									
Zeaxanthin							YES			
Chlorophyll α	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Chlorophyll β	Depends on Symbiont (Endo- or Exo-)									
Chlorophyll c2	YES									
Chlorophyll c3	Depends on Symbiont									
Floridoside							YES			
Alanine Ala			10.6							
Arginine Arg			3.78							
Aspartate Asp			9.48							
Glutamate Glu			13.6							
Glycine Gly			12.27							
Histidine His			1.91							
Isoleucine Ile			3.68							
Leucine Leu			7.38							
Lysine Lys			7.3							
Methionine Met			1.52							
Phenylalanine Phe			2.8							
Proline Pro			3.53							
Serine Ser			9.83							
Threonine Thr			4.27							
Tyrosine Tyr			1.74							
Valine Val			6.07							

Data collected by Richard L. Hubbard larviculture@hotmail.com Nova Southeastern University Oceanographic Center - Dania Beach, Florida

YES Present | SHOULD BE PRESENT | NOT PRESENT | VALUE UNKNOWN | 12345 VALUES for GENUS - SPECIES UNKNOWN

Numerical values are as per author. It should be noted that these values may vary depending upon environmental and nutritional conditions in the culture.